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**MARITIME** Strategy


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# Agenda

- Welcome & Introductions
- North Carolina Maritime Strategy Goals & Objectives
- Current North Carolina Freight Context
- Trends in Global Goods Movement
- Competitive Position
- Potential Market Positions
- Study Process and Results – Interactive Discussion

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# Welcome

- Roberto Canales PE, Secretary's Coordinator of Strategic Initiatives, North Carolina Department of Transportation
- Col. Beth Austin, J4/Deputy Chief of Staff for Logistics, North Carolina National Guard

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# Maritime Strategy Executive Team

- Walter Dalton – Lt. Governor (Chair)
- Al Delia – Governor's Policy Advisor (Vice Chair)
- Keith Crisco – Secretary Department of Commerce
- Dee Freeman – Secretary Department of Environment and Natural Resources
- Gene Conti – Secretary of Transportation

- Roberto Canales, PE – NCDOT (Staff Lead / MSET Liaison)
- Virginia Mabry – NCDOT (Project Manager)

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# Maritime Advisory Council

- Public and private sector industry representatives from shippers, shipping lines, trucking, railroad, agricultural and manufacturing interests, along with government, policy, academic and community-at-large representatives
- Provide guidance to the project team, based on mission defined by the Maritime Study Executive Team
- As a hands-on, engaged advisory body, the Advisory Council will meet three to four times during the year to support strategy development at major project milestones

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# Project Team

- **AECOM**
  - Global engineering firm with 52,000 staff in 100 countries
  - Industry leader in transportation, rail/transit, ports & marine
  - 25 years in North Carolina
- **URS**
  - Global engineering firm with 45,000 staff
  - 45 years in North Carolina
- **Eydo**
  - public involvement for NCDOT and NCRR

**THE TOP 500 DESIGN FIRMS**

| RANK 2010 | RANK 2009 | FIRM |
|---|---|---|
| 1 | 2 | AECOM TECHNOLOGY CORP., Los Angeles |
| 2 | 3 | URS CORP., San Francisco, Calif.† |
| 3 | 1 | JACOBS, Pasadena, Calif. |
| 4 | 4 | FLUOR CORP., Irving, Texas† |
| 5 | 5 | CH2M HILL, Englewood, Colo.† |
| 6 | 7 | BECHTEL, San Francisco, Calif.† |
| 7 | 10 | AMEC, Tucker, Ga.† |
| 8 | 8 | TETRA TECH INC., Pasadena, Calif.† |
| 9 | 9 | KBR, Houston, Texas† |
| 10 | 6 | THE SHAW GROUP INC., Baton Rouge, La |
| 11 | 13 | HDR, Omaha, Neb.† |
| 12 | 11 | PARSONS BRINCKERHOFF INC., New York |
| 13 | 12 | PARSONS, Pasadena, Calif.† |
| 14 | 15 | BLACK & VEATCH, Overland Park, Kan.† |

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# Goals and Objectives

- The State of North Carolina has initiated the development of the *North Carolina Maritime Strategy* to serve as an open evaluation of North Carolina's position, opportunities and challenges as a portal for global maritime commerce.
- The study will examine the role that North Carolina ports play in sustaining and strengthening the State's economy, and identify specific strategies to optimize benefits received from the State's investments in port and associated transportation infrastructure.
- The *North Carolina Maritime Strategy* is being prepared as the expansion of the Panama Canal nears its scheduled 2014 completion, and the United States recognizes the increasing importance of exports to national and regional economic growth.

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# Goals and Objectives

- The Governor's Logistics Task Force (GLTF) recommended that the *Maritime Strategy* be initiated to evaluate North Carolina ports' current and future role in strengthening the state's economy.
- The *Maritime Strategy* will complement and coordinate with the 7 Portals Study, also initiated by the GLTF.


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# North Carolina Freight Context

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## North Carolina's major trading partners vary depending on your perspective...

| NC Top Import Origins by Value (All Modes) | NC Top Import Origins by Volume (into NC Ports) | NC Top Export Destinations by Value (All Modes) | Top Export Destinations by Volume (from NC Ports) |
|---|---|---|---|
| **1. China** | **1. China (POW)** | 1. Canada | **1. China (POW, MC)** |
| **2. Mexico** | 2. Brazil (POW) | **2. China** | 2. India (MC) |
| 3. Canada | **3. Mexico (MC)** | 3. Mexico | **3. Brazil (MC)** |
| 4. Germany | 4. Korea (POW) | 4. Japan | 4. Korea (POW) |
| 5. Japan | 5. Columbia (POW) | 5. France | 5. Belgium (POW) |
| **6. United Kingdom** | 6. Venezuela (MC) | **6. United Kingdom** | 6. Taiwan (POW) |
| 7. Ireland | 7. Belgium (POW) | 7. Germany | 7. Turkey (POW) |
| 8. France | 8. Indonesia (MC) | **8. Honduras** | **8. Great Britain (POW)** |
| 9. Singapore | **9. United Kingdom (POW)** | **9. Brazil** | 9. Argentina (MC) |
| 10. Italy | 10 Taiwan (POW) | 10. Hong Kong | **10. Honduras (POW)** |

*Source: US Census, NCSPA*

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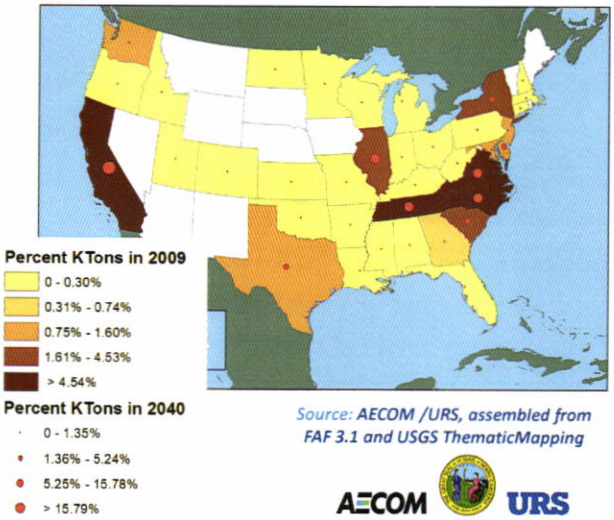
## States that use North Carolina's ports to export, 2009 & 2040




*Source: AECOM /URS, assembled from FAF 3.1 and USGS ThematicMapping*

- Tennessee shippers use NC port facilities more than in-state shippers do (by volume)
- Illinois shippers use NC port facilities more than in-state shippers (by value)
- California shippers are the third largest customer base for NC ports (by volume)
- Despite the health of the ports in their own states, Virginia and South Carolina shippers still rank in the top ten among state customer bases for NC ports

*Shading in chart reflects exports by volume.*

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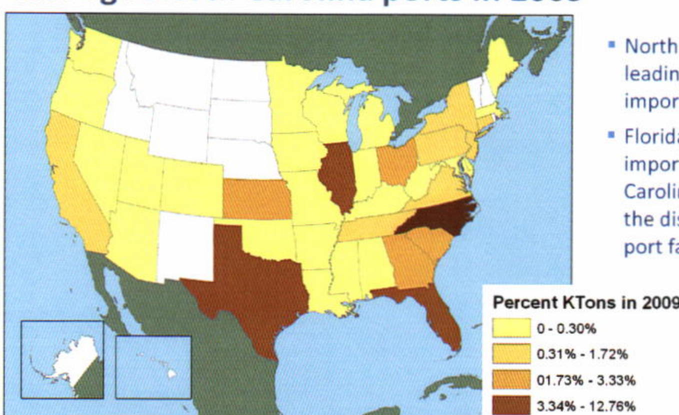
## Domestic destination of imports entering the US through North Carolina ports in 2009




- North Carolina is the leading destination for imports by large margin
- Florida, Illinois and Texas importers use North Carolina facilities despite the distance and their own port facilities

*Shading in chart reflects exports by volume.*

*Source: AECOM /URS, assembled from FAF 3.1 and USGS ThematicMapping*

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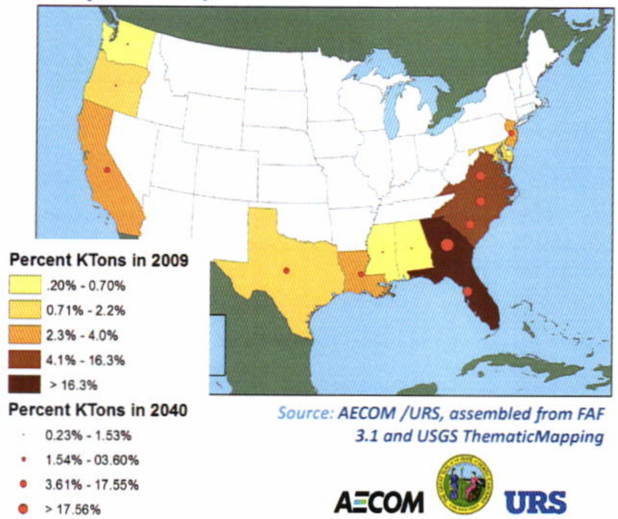
## Waterborne exports from North Carolina by state of departure, 2009 and 2040




*Source: AECOM /URS, assembled from FAF 3.1 and USGS ThematicMapping*

- North Carolina shippers use facilities in Florida and Georgia more than NC ports
- Virginia and South Carolina are also important to North Carolina shippers
- Southeastern gateways favored
- Current export trade pattern expected to persist

*Shading in chart reflects exports by volume.*

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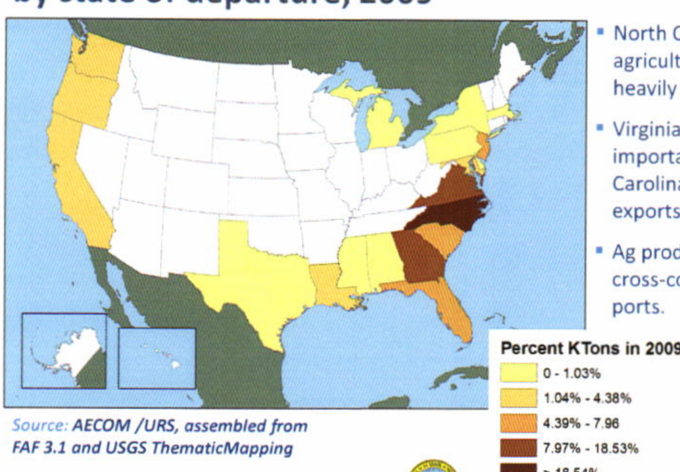
## Waterborne agricultural exports from North Carolina by state of departure, 2009




*Source: AECOM /URS, assembled from FAF 3.1 and USGS ThematicMapping*

- North Carolina exporters of agricultural goods rely most heavily on in-state facilities.
- Virginia and Georgia are also important for North Carolina's agricultural exports.
- Ag products also shipped cross-country to West Coast ports.

*Shading in chart reflects exports by volume.*

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## Leading North Carolina commodity exports and imports

| Imports | Exports |
|---|---|
| 1. Medical products | 1. Civilian aircraft parts |
| 2. Machinery | 2. Medical products |
| 3. Apparel | 3. Tobacco products |
| 4. Uranium | 4. Specialty textiles |
| 5. Motor vehicles | 5. Chemicals |

*Source: **US Census***
*All modes, ranked by value, 2010*

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## Leading commodities arriving at North Carolina ports, by truck and by rail

| Arriving by Truck (by value) | Arriving by Truck (by volume) | Arriving by Rail (by value) | Arriving by Rail (by volume) |
|---|---|---|---|
| **1. Other Ag Products** | 1. Wood Products | **1. Precision Instrmts** | 1. Basic Chemicals |
| **2. Machinery** | **2. Textiles/Leather** | 2. Basic Chemicals | **2. Newsprint/Paper** |
| **3. Textiles/Leather** | **3. Plastics/Rubber** | **3. Tobacco Products** | **3. Waste/Scrap** |
| **4. Plastics/Rubber** | **4. Other Ag Products** | **4. Newsprint/Paper** | **4. Wood Products** |
| 5. Tobacco Products | 5. Newsprint/Paper | **5. Textiles/Leather** | **5. Precision Instrmts** |
| **6. Chemical Products** | 6. Waste/Scrap | 6. Chemical Products | 6. Logs |
| **7. Basic Chemicals** | 7. Animal Feed | **7. Wood Products** | 7. Nonmetallic Min. |
| 8. Motorized Vehicles | **8. Basic Chemicals** | 8. Misc. Mfg. Products | **8. Unknown** |
| 9. Electronics | **9. Chemical Products** | **9. Waste/Scrap** | **9. Tobacco Products** |
| 10. Misc. Mfg. Products | **10. Machinery** | **10. Unknown** | **10. Textiles/Leather** |

*Source: **FAF 3.1***

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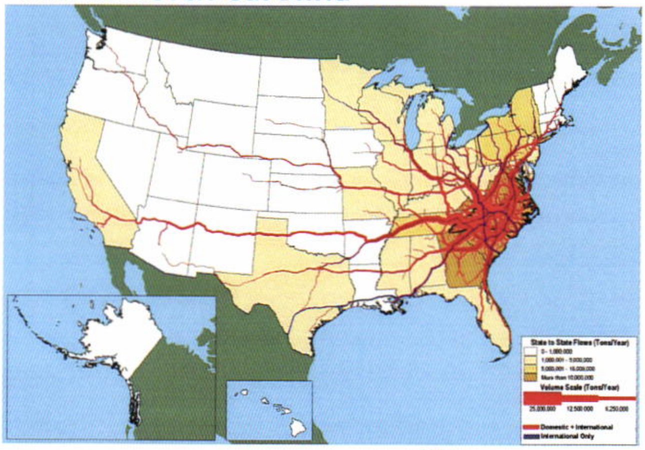
## Major truck routes for goods traveling to, from, and within North Carolina



Source: **FAF 2.3**

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## Highway capacity on major truck routes, peak

2007

2035

Source: **USDOT**

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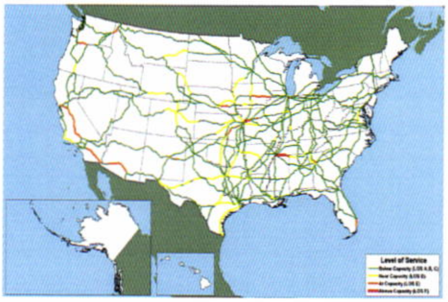
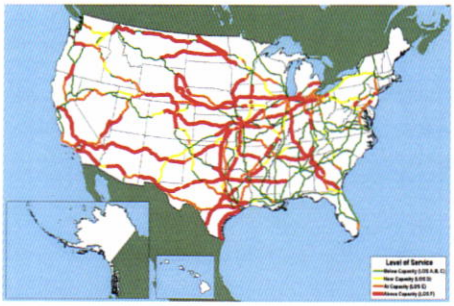
## Rail capacity

2007



2035



*Source: **AAR, 2007***

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## North Carolina railroad system


*Map: **North Carolina Railroad***

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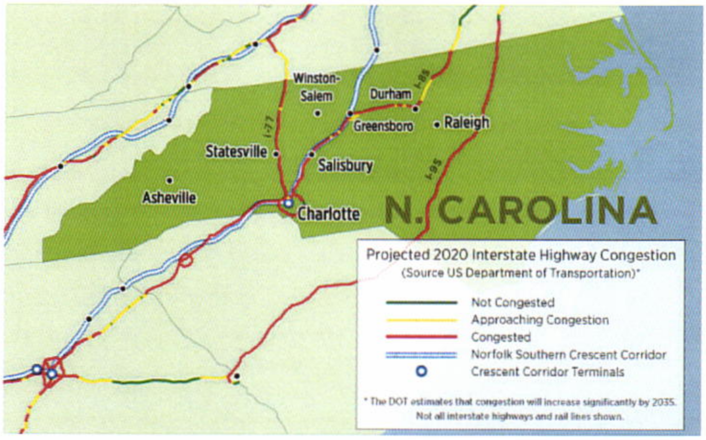
## Major rail routes: the Crescent Corridor




Map: www.thefutureneedsus.com

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# Trends in Global Goods Movement

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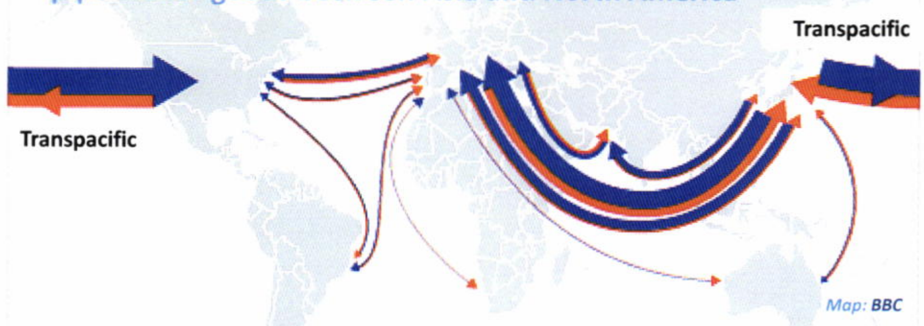
## Today, US imports are driven by China trade

### China's entry into WTO was a game-changer…

…creating the need for a new, high-capacity, point-to-point pipeline for goods between Asia and North America




*Map: BBC*

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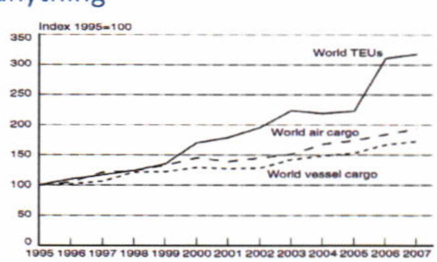
## Containerization

- 20th Century revolution in freight handling through increased security and efficiency
- Reduced dwell time for intermodal cargo
- Containers are now used for almost anything




*Source: US Bureau of Transportation Statistics*

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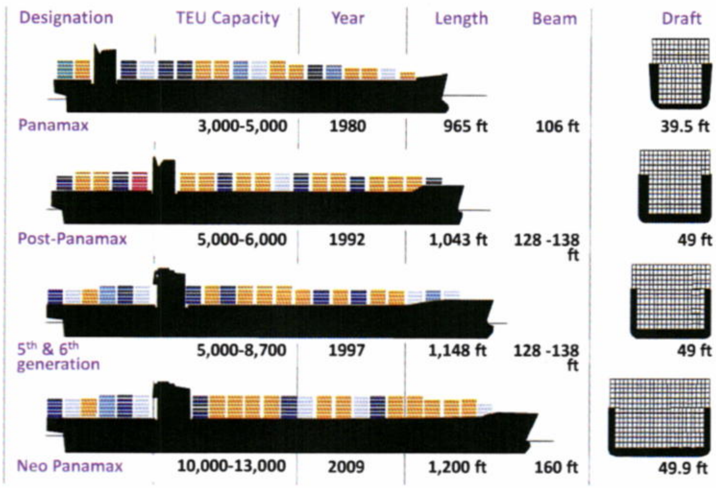
## Larger vessels




*Source: graphic adapted from www.GlobalSecurity.org*

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## Panama Canal expansion – a new paradigm?

*Map: Panama Canal Authority*

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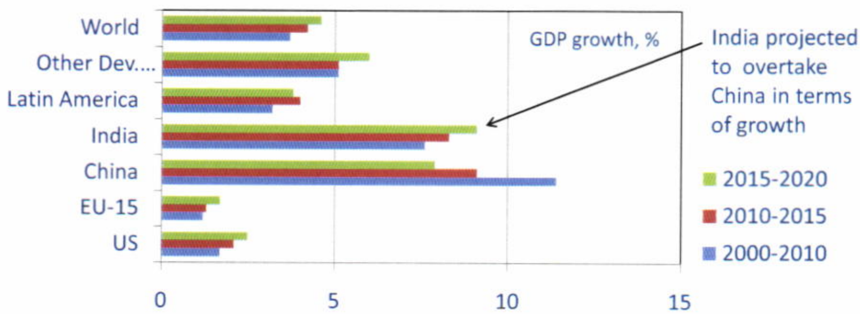
## Growth outlook for North Carolina's global partners




*Source: Conference Board Global Economic Outlook, March 2011*

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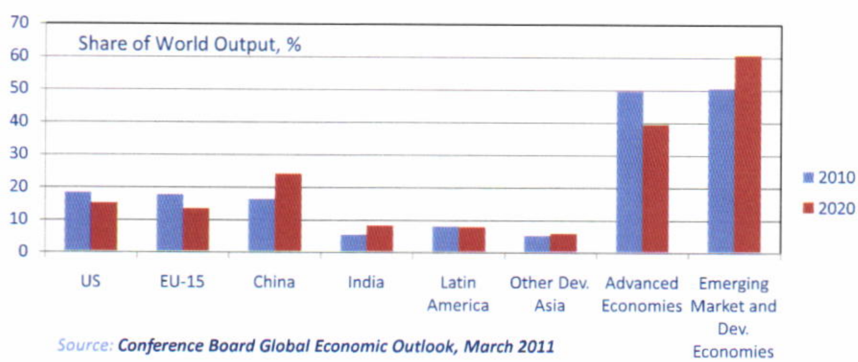
## Growth is not the only measure that counts – size of the economy matters too…




*Source: Conference Board Global Economic Outlook, March 2011*

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# North Carolina's Competitive Position

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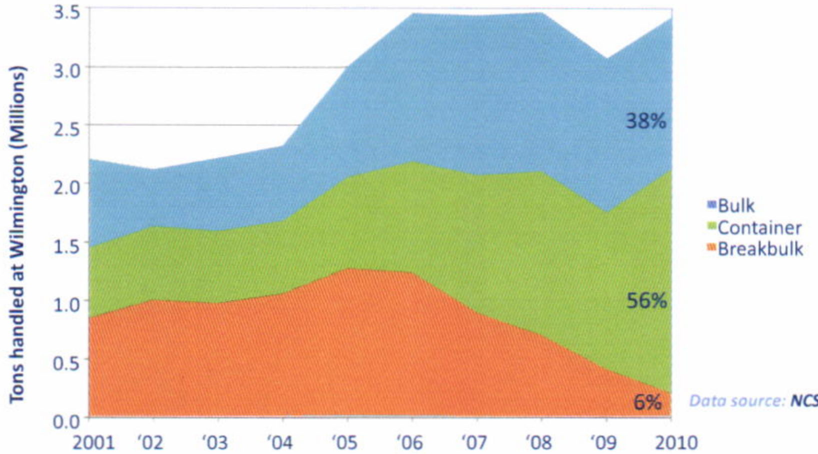
## Port of Wilmington cargo volumes by mode




*Data source: NCSPA*

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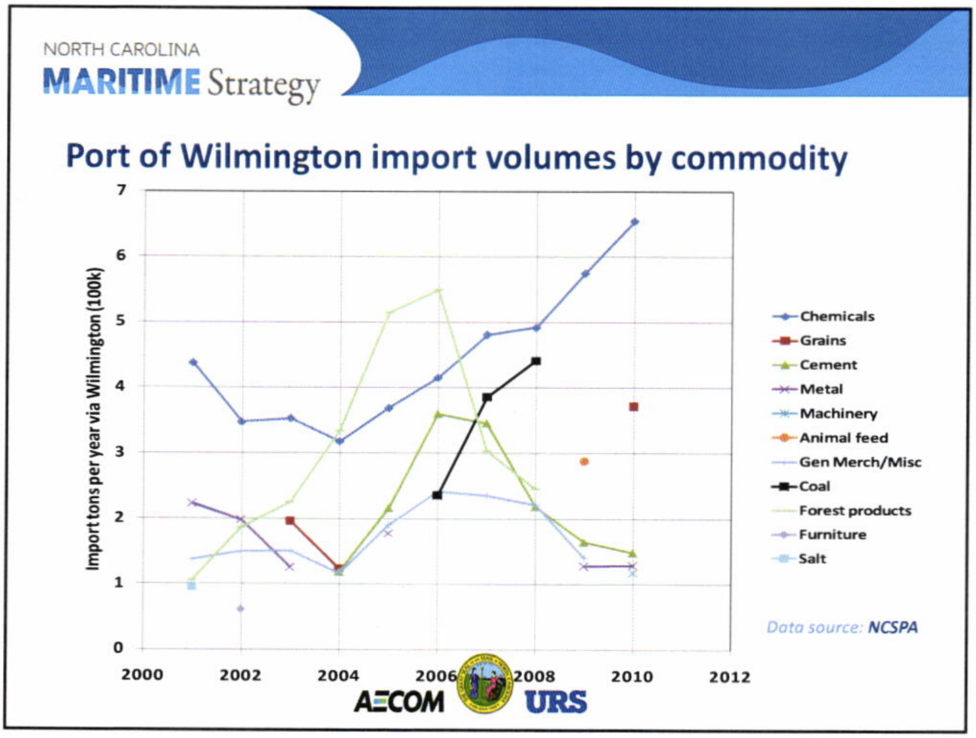
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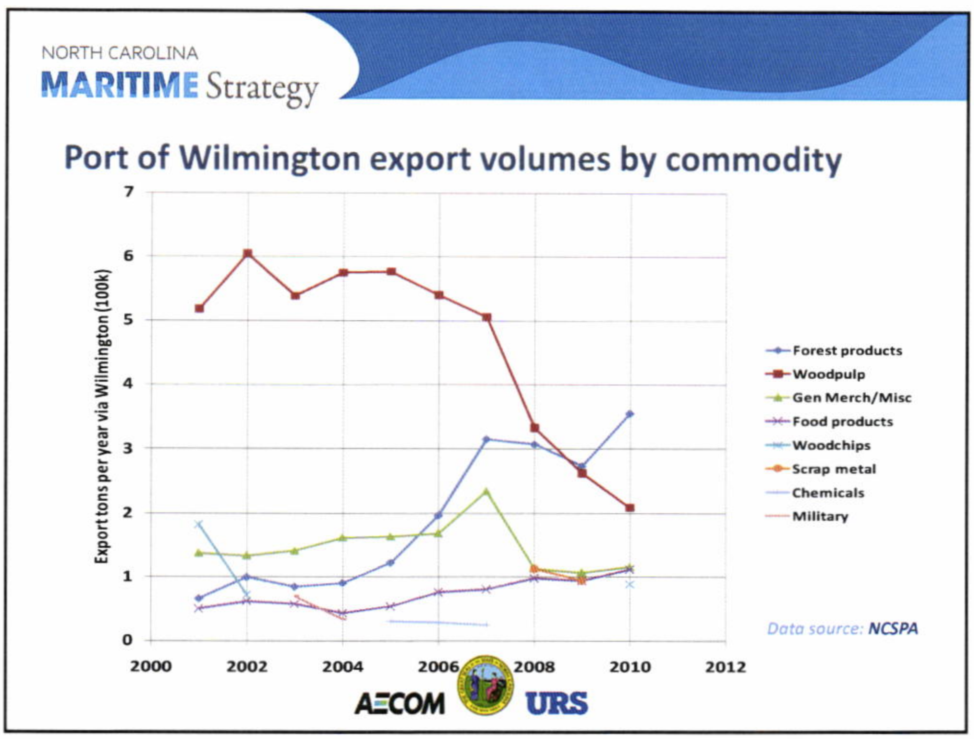
Port of Wilmington import volumes by commodity
Import tons per year via Wilmington (100k)
0
1
2
3
4
5
6
7
2000
2002
2004
2006
2008
2010
2012
Chemicals
Grains
Cement
Metal
Machinery
Animal feed
Gen Merch/Misc
Coal
Forest products
Furniture
Salt
Data source: NCSPA
AECOM
URS


NORTH CAROLINA
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Port of Wilmington export volumes by commodity
Export tons per year via Wilmington (100k)
0
1
2
3
4
5
6
7
2000
2002
2004
2006
2008
2010
2012
Forest products
Woodpulp
Gen Merch/Misc
Food products
Woodchips
Scrap metal
Chemicals
Military
Data source: NCSPA
AECOM
URS

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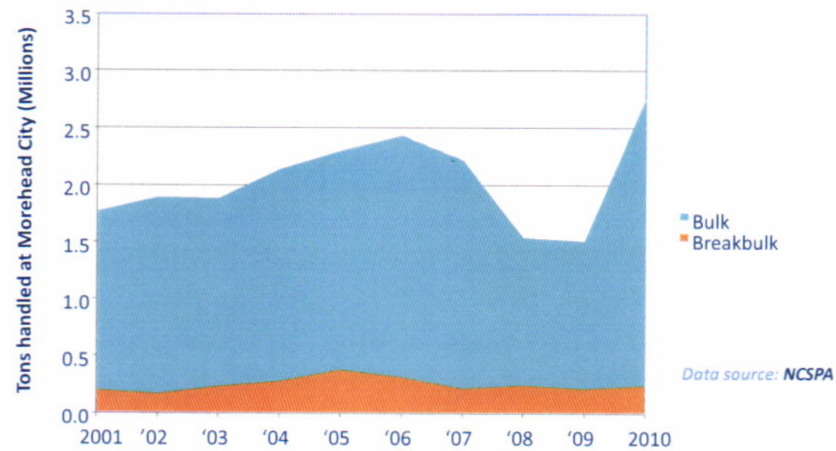
## Port of Morehead City cargo volumes by mode

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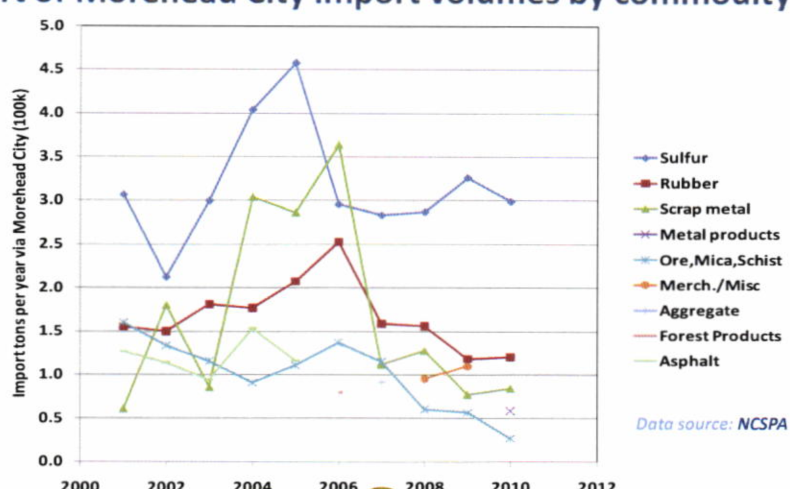
## Port of Morehead City import volumes by commodity

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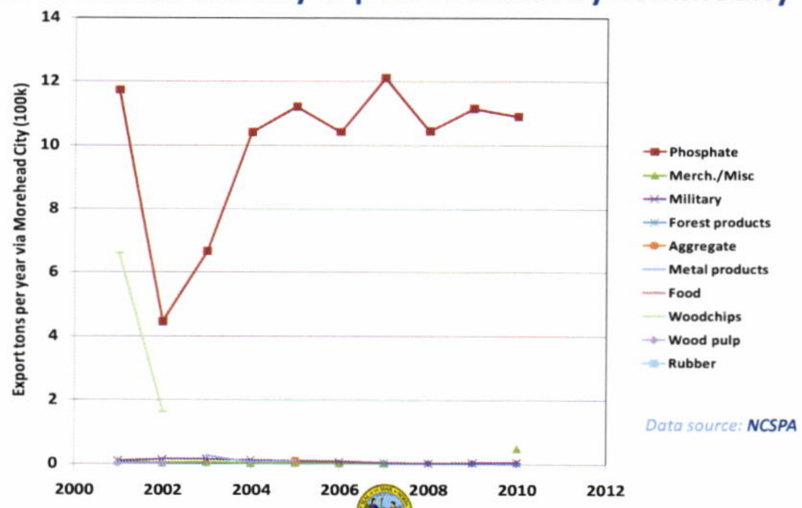
## Port of Morehead City export volumes by commodity

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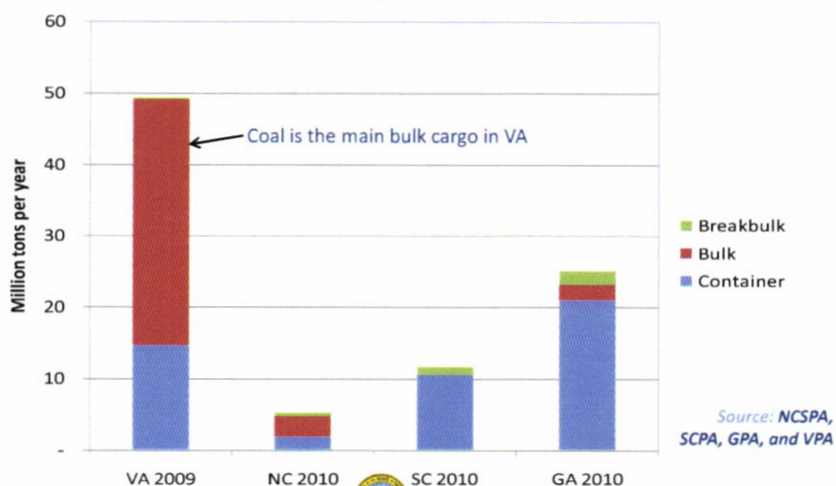
## Mode split across regional ports

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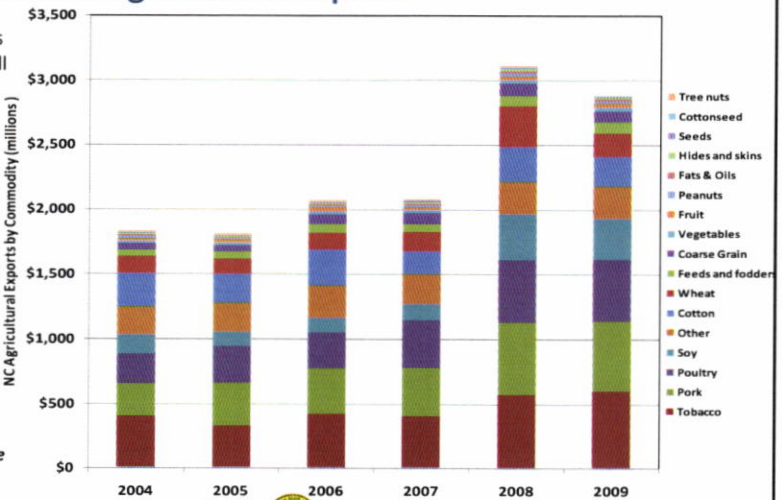
## North Carolina agricultural exports

Includes goods exported via all modes




*Data source: **NC Dept of Agriculture***

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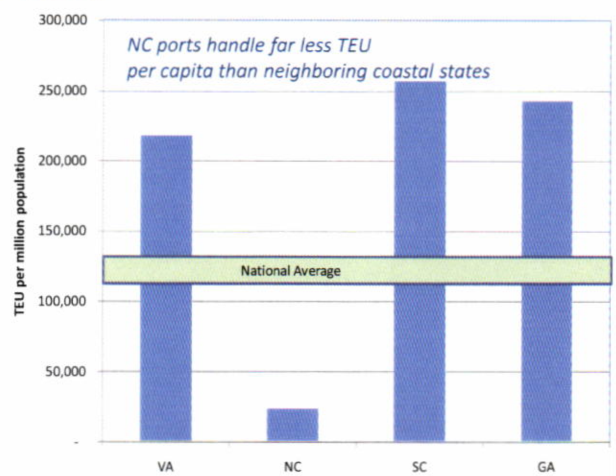
## Regional container trade

- US container volumes and growth rates closely track gross domestic product (GDP) and can be correlated to regional population

  37.2M TEU (import + export) handled by US Ports in 2009
  308M people in 2010 census

  = 121,000 TEU per million Americans (this was ~140,000 before recession)

- Ports in neighboring states are capturing the value of containerized goods destined for consumption – via truck & rail – to NC




*Source: **AECOM, based on data from AAPA, US Census***

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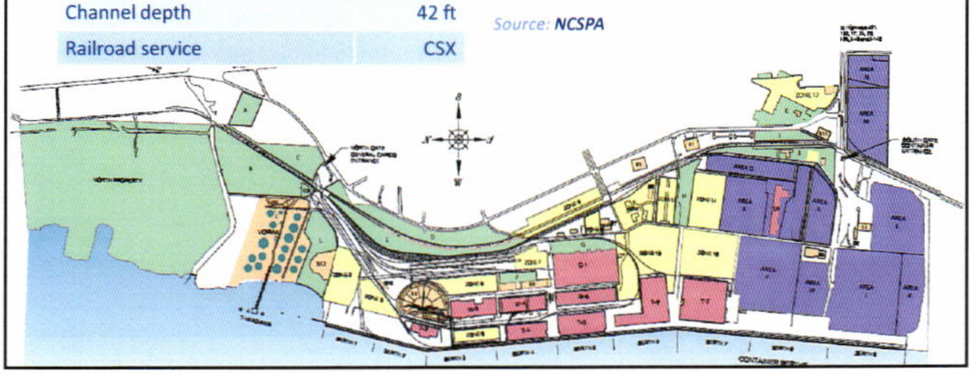
## Port of Wilmington

| | |
|---|---|
| Estimated berth length | 2,500 ft |
| Dock cranes | 9 |
| Terminal area | 284 acres |
| Estimated container area | 80 acres |
| Mode | RTG |
| Channel depth | 42 ft |
| Railroad service | CSX |

*Source:* ***NCSPA***



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## Port of Morehead City

| | |
|---|---|
| Estimated berth length | 4,500 ft |
| Dock cranes | 0 |
| Terminal area | 140 acres |
| Est. container area | 0 acres |
| Mode | bulk handling |
| Channel depth | 45 ft |
| Railroad service | NS |

*Source:* ***NCSPA***

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## Virginia APMT Terminal

| | |
|---|---|
| Estimated berth length | 3,025 ft |
| Dock cranes | 6 |
| Terminal area (container) | 291 acres |
| Mode | ASC |
| Channel depth | 55 ft |
| Railroad service | NS & CSX |

Source: ***VPA and I-95 Coalition***

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## Virginia NIT Terminal

| | |
|---|---|
| Estimated berth length | 5,730 ft |
| Dock cranes | 14 |
| Terminal area (container) | 648 acres |
| Mode | Strad |
| Channel depth | 48 ft |
| Railroad service | NS & CSX |

Source: ***VPA and I-95 Coalition***

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## Virginia PMT Terminal

| | |
|---|---|
| Estimated berth length | 3,540 ft |
| Dock cranes | 9 |
| Terminal area (container) | 219 acres |
| Mode | Strad |
| Channel depth | 43 ft |
| Railroad service | NS & CSX |

*Source: VPA and I-95 Coalition*

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## Charleston Wando Welch Terminal

| | |
|---|---|
| Estimated berth length | 3,800 ft |
| Dock cranes | 10 |
| Terminal area (container) | 242 acres |
| Mode | RTG / TP |
| Channel depth | 45 ft |
| Railroad service | NS & CSX |

*Source: SCPA and I-95 Coalition*


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## North Charleston Terminal

| | |
|---|---|
| Estimated berth length | 2,500 ft |
| Dock cranes | 6 |
| Terminal area (container) | 130 acres |
| Mode | RTG / TP |
| Channel depth | 40 ft |
| Railroad service | NS & CSX |

*Source: **SCPA and I-95 Coalition***


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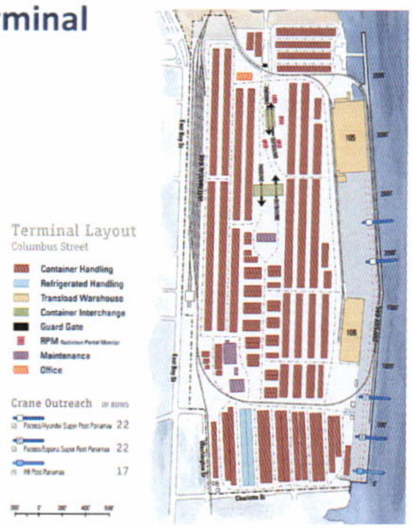
## Charleston – Columbus St Terminal

| | |
|---|---|
| Estimated berth length | 3,500 ft |
| Est. container berth length | 2,500 ft |
| Dock cranes | 5 |
| Terminal area | 78 acres |
| Mode | RTG / TP |
| Channel depth | 45 ft |
| Railroad service | NS & CSX |

*Source: **SCPA and I-95 Coalition***

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## Savannah – Garden City Terminal

| | |
|---|---|
| Estimated berth length | 9,693 ft |
| Dock cranes | 23 |
| Terminal area (container) | 1,200 acres |
| Mode | RTG / TP |
| Channel depth | 48 ft |
| Railroad service | NS & CSX |

Source: ***GSPA and I-95 Coalition***

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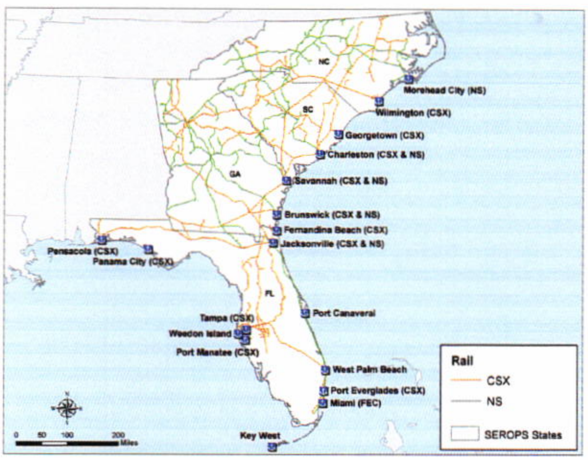
## Competitive position: rail access




| Port | Rail Service |
|---|---|
| Norfolk | NS & CSX |
| Morehead City | NS |
| Wilmington | CSX |
| Charleston | NS & CSX |
| Savannah | NS & CSX |

Map: ***I-95 Coalition***

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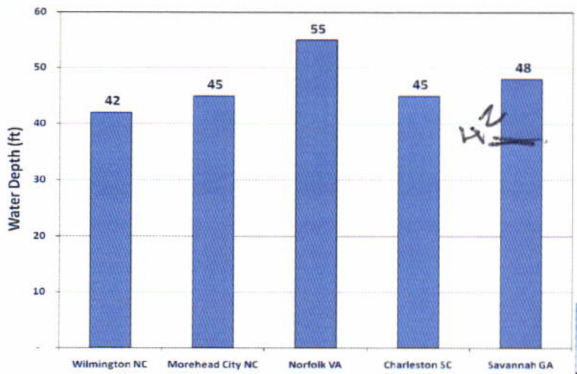
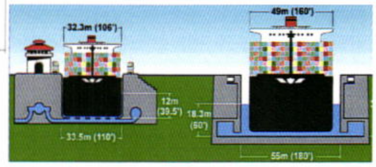
## Competitive position: main channel depth




- Wilmington channel depth is less than other regional ports
- Water depth at Morehead City is more competitive but less than Neo Panamax
- Vessels need min 4' clear below keel




*Graphic:* ***Lloyds Register***

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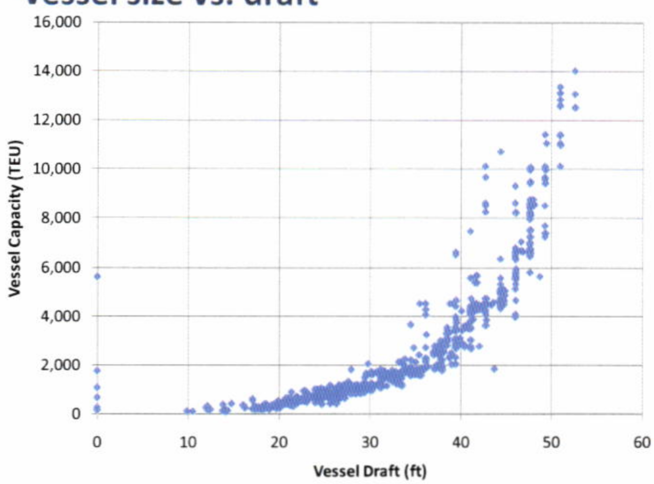
## Vessel size vs. draft




- Vessels typically operate at 80-90% of design draft
- A vessel with 45' design draft may only draw 38' of water
- This same vessel will require a 42' channel

*Source:* ***Fairplay***

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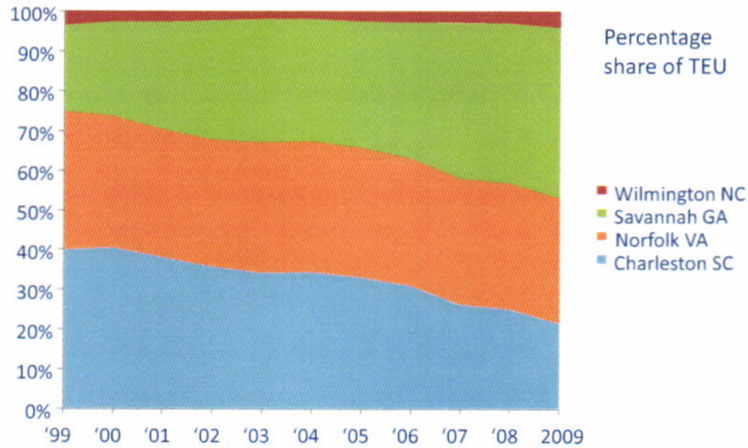
## Competitive position: regional container market share

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New dock crane = $10mm

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## Competitive position: dock crane outreach

**Outreach of existing dock cranes (# of containers)**

| Port | Total | <16 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wilmington NC | 9 | 5 | | | 4 | | | | | | | |
| Norfolk VA | 29 | 1 | 2 | 3 | 3 | | | | 6 | 6 | | 8 |
| Charleston SC | 22 | 6 | 10 | | | | | 4 | 2 | | | |
| Savannah GA | 23 | | 5 | | 6 | | | | 12 | | | |

- Neo Panamax containerships require minimum dock crane outreach of 19-20 containers

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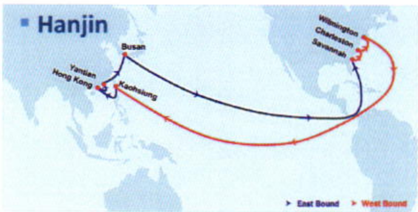
## Routes of container shipping lines calling on Port of Wilmington

- **Maersk**



- **Hanjin**




- **Yang Ming**


*NY is first YML US Port of Call*

Maps: ***Maersk, ICL, Hanjin, YML***

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## Planned future terminals in the region

- Craney Island, Norfolk: 500 Acres, 2.1M TEU Capacity
- Charleston Navy Base: 280 Acres, 1.2M TEU Capacity
- Jasper County Terminal (SC+GA): 1500 Acres, 6.2M TEU Capacity

Notes:

- Existing and future capacities to be refined by AECOM over the course of the project
- These projects are pending market demand, funding, and environmental permitting, especially for dredging in SC and GA

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# Potential Market Positions

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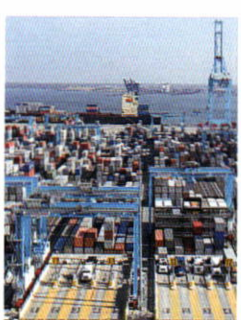
## Mega container terminal

- 50+' water depth to accommodate Neo Panamax vessels
- Dock cranes of minimum 20 container reach
- 3 or more contiguous berths
- High density (stacked) container storage area (backland)
- Automated or automatable
- On-terminal rail in North America



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## Mid-range container terminal

- 40+' water depth to accommodate Panamax vessels
- Dock cranes with minimum reach of 13 containers
- 2 or more contiguous berths
- Medium to high density (stacked) container storage area (backland)
- Rail on- or near terminal is desirable in North America

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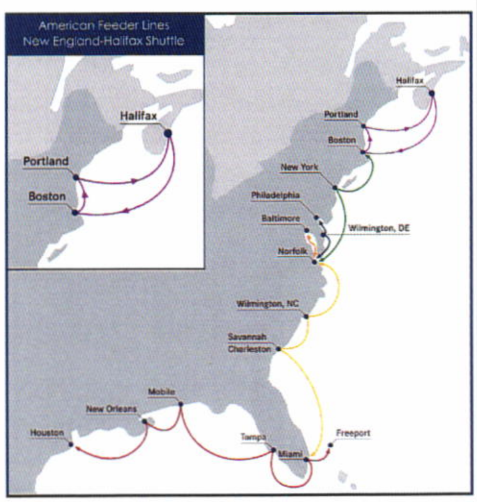
## Example: American Feeder Lines is a new company with USEC transshipment business model

- Inset: New England Halifax Shuttle & Planned Routes
- "First service will employ modern container feeder of 1,000 - 1,300 TEU capacity in a weekly service connecting Boston, MA. and Portland, ME with Halifax, NS/Canada."




*Map: American Feeder Lines*

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## Container-on-barge services

- Requires only 10'+ water depth
- Barges can be 36 TEU or larger
- Single tug can move multiple barges
- Very common in Europe
- 4% of Norfolk containers move via barge

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## Roll-on, Roll-off (Ro-Ro) service

- 35'+ water depth
- No cranes required
- Open storage area near wharf
- Rail access is desirable for auto market

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## Bulk goods

- 40'+ water depth, considerably more for some cargos
- Specialized vessel loaders, or mobile harbor cranes with grabs
- Custom storage facilities
- Silos/buildings for dry goods
- Custom loaders for trains/trucks

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## Breakbulk goods

- 40'+ water depth
- Mobile harbor cranes with various grabs are most common
- Open storage area or warehousing near wharf
- Many traditional breakbulk goods are now moving by container...

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## Project and military cargo

- 35'+ water depth
- Mobile harbor cranes with various grabs are most common
- Loading/storage/security needs vary for various military cargo
- Rail access on dock is appealing for heavy loads
- Open storage area near wharf
- Wind turbines have been high growth market

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## Comparison of market alternatives: measuring potential benefits from port investment

- Job creation and associated earnings
- Economic diversity
  - Resilience to economic cycles
  - Compatibility with the State's other significant economic drivers
- Productivity gains to industry: competitiveness
- Public benefits
  - Fiscal returns to the state
  - Potential to reduce road VMT when part of larger freight plan
  - Potential to focus freight in particular corridors and reduce freight and passenger conflicts when part of larger freight plan
  - Alignment with State sustainability objectives for land use, greenhouse gasses, and other environmental impacts

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## Leading company site selection factors offer insight into port competitiveness factors

| Factor (corporate survey) | % Very Imp. Or Important | Factor (consultant survey) | % Very Imp. Or Important |
|---|---|---|---|
| Highway accessibility | 97.3 | Labor costs | 96.8 |
| Labor costs | 91.0 | State and local incentives | 96.8 |
| Tax exemptions | 90.9 | Highway accessibility | 95.8 |
| Occupancy or const. costs | 89.9 | Availability of skilled labor | 92.6 |
| State and local incentives | 89.3 | Energy availability and cost | 91.5 |
| Corporate tax rate | 86.3 | Proximity to major markets | 90.5 |
| Availability of skilled labor | 85.9 | Tax exemptions | 88.4 |
| Inbound/outbound shipping costs | 84.0 | Occupancy or construction costs | 88.3 |
| Energy availability and costs | 82.1 | Corporate tax rate | 86.4 |
| Availability of buildings | 81.0 | Availability of buildings | 86.3 |

*Source:* ***North Carolina Department of Commerce and Area Development, 2011***

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## Large variation in criteria used by states and others to evaluate freight project outcomes

| Criteria | OH | WI | MN | MO | VA | Scot |
|---|---|---|---|---|---|---|
| ***Transportation Drivers of Economic Impact*** | | | | | | |
| Multi-modal & Intermodal facilities | X | | X | X | X | X |
| Connectivity to key statewide corridors | | X | | X | | X |
| Supports desired land development clusters | | X | | X | | X |
| Predictability of travel times | | | X | | | X |
| Connectivity of access to global markets | | | X | | | |
| Concentration of trucks for goods movement | | | | | X | |
| Enhances competitiveness of shipping rates | | | X | | | |
| Reduces bottlenecks and size/wt impediments | | | X | X | | |
| Supports economic development initiatives | | | | X | | |
| Supports redevelopment of old industrial areas | X | | | | | |
| Location in economically distressed area | X | | | X | X | |
| ***Economic Growth Outcomes*** | | | | | | |
| Job creation – supports industry attraction | X | X | | | | X |
| Job retention – supports existing industry | X | X | | | | X |
| Public-private participation in funding | X | | | | | |

**Legend:**

- OH: Ohio DOT rating system
- WI: Wisconsin DOT rating system
- MN: Minnesota DOT rating system
- MO: Missouri DOT rating system
- VA: Virginia DOT rating system
- Scot: The Scottish appraisal system

*Source:* ***EDRG Report prepared for Port of Portland and Portland Business Alliance***

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# Study Process and Results

How can North Carolina position itself to be a portal to the global maritime economy?

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## Study outcomes

- ✓ Decision tool and process for evaluating port and related multi-modal investments
- ✓ Basis for long- and short-term investment strategy for more efficient, effective and safe movement of waterborne cargo in and out of the state
- ✓ Identification of priority projects
- ✓ Support for long-range planning
- ✓ Address institutional issues to approach maritime transportation issues in a more seamless manner

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## Expectations of the Advisory Council

- Act as a hands-on, advisory body to guide the development of the *North Carolina Maritime Strategy*
- Participate in meetings and/or discussions of the Advisory Council at key project milestones over the year
- Provide guidance and input to the project team on project findings and alternatives
- Offer insight to the study process based on your knowledge of the industry
- Facilitate project team discussions with stakeholders within industry

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## Key challenges and opportunities

1. How would you define success for the Maritime Strategy?
2. What are some of the major transportation issues affecting trade and economic growth in North Carolina?
3. What types of investments in infrastructure (ports and port-related rail and highways) would encourage you to use NC ports?
4. Are there other issues affecting trade and growth that should be addressed?

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## Schedule and next steps

| | |
|---|---|
| Media release / public project launch | May 6, 2011 |
| **Advisory Council meeting 1** (freight flows/trends) | May 9 |
| Project website launch: www.ncmaritimestudy.com | April 28 & May (expanded) |
| Project brochure | Late May |
| Public workshops – series 1 | June |
| Stakeholder meetings | May thru September |
| **Advisory Council meeting / input** (market scenarios) | July |
| **Advisory Council meeting / input** (infrastructure needs) | August/September |
| **Advisory Council meeting / input** (evaluation approach) | September/October |
| Public workshops – series 2 | Fall |
| **Advisory Council meeting / input** (decision matrix) | December |

*Note: Advisory Council input may be solicited via teleconference or document review in lieu of in-person meetings*

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